CORRECTIONS

In Walt Jung's "Sources 101: Audio Current Regulator Tests for High Performance Part 1: Basics of Operation," (*aX* 4/07), there is a note on page 12 leading the reader to a "Hofer" box, on page 8. The box was actually featured on page 21.—Eds.

Regular contributor Charles Hansen points out an error in the six-transistor MC preamp schematic (*aX* 4/07, p. 48). The connection from R1 to the base of Q1 should go from R1 to the emitters of Q1 and Q4.--Eds.

In my article "A Low-Noise Measurement Preamp" (*aX* April '07) there's a connection line omitted in Fig. 1A (p. 26). A line should go *from* U2B (erroneously labeled *V*2B) pin 7 (its output) *to* the terminal on switch S3 labeled "FLAT."

Dennis Colin
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In the April 2007 issue, Dennis Colin left something out in the schematic of his "Low-Noise Measurement Preamp." In addition to the S3A and S3B is another S3 in the lower right corner. If it is flipped to the "Flat" position, the response will be extremely flat—nothing out from DC to infinite frequency! I'm sure it should be connected to something. I suspect this switch is actually S5, as 5 switches are shown in the parts list, but only S1-S4 are on the schematic. Please publish a correction.

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Dennis Colin responds:

The lower right switch should be S5, and its terminal labeled "FLAT" should be connected to U2B (mislabled ("V2B") pin 7 (output). There's a more serious error, as Brad Wood discovered: R8 should be 51.1k, not 1.5k. The parts list shows the correct value, but the schematic is wrong.

The input capacitance is 33pF, as shown in Table 3. The 72pF on the box in Photo 4 is wrong; that one is my mistake. Also, please note my comments about the JFET in my response to Brad Wood's letter. Thank you for observing the errors.

These errors are corrected in Fig. 1A.

SRPP TOPOLOGY

I read Chris Paul's article "The Cathode Follower and Its Weaker Siblings"[1] with great interest because I have some experience with such circuits also, in particular the SRPP (**Fig. 1**). I totally agree with Chris's comment that the output impedance of the SRPP is a lot worse than the

FIGURE 1: The SRPP.

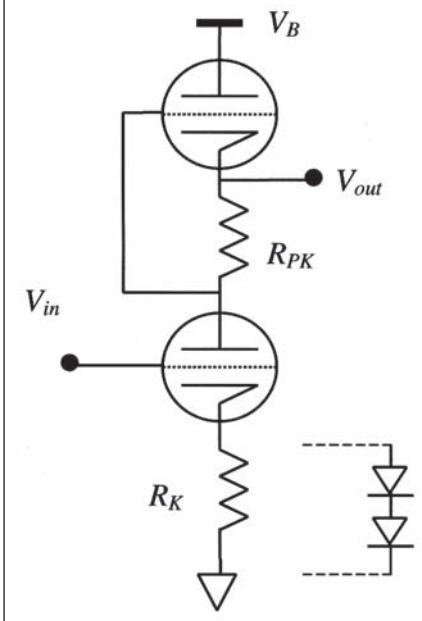

FIGURE 1A

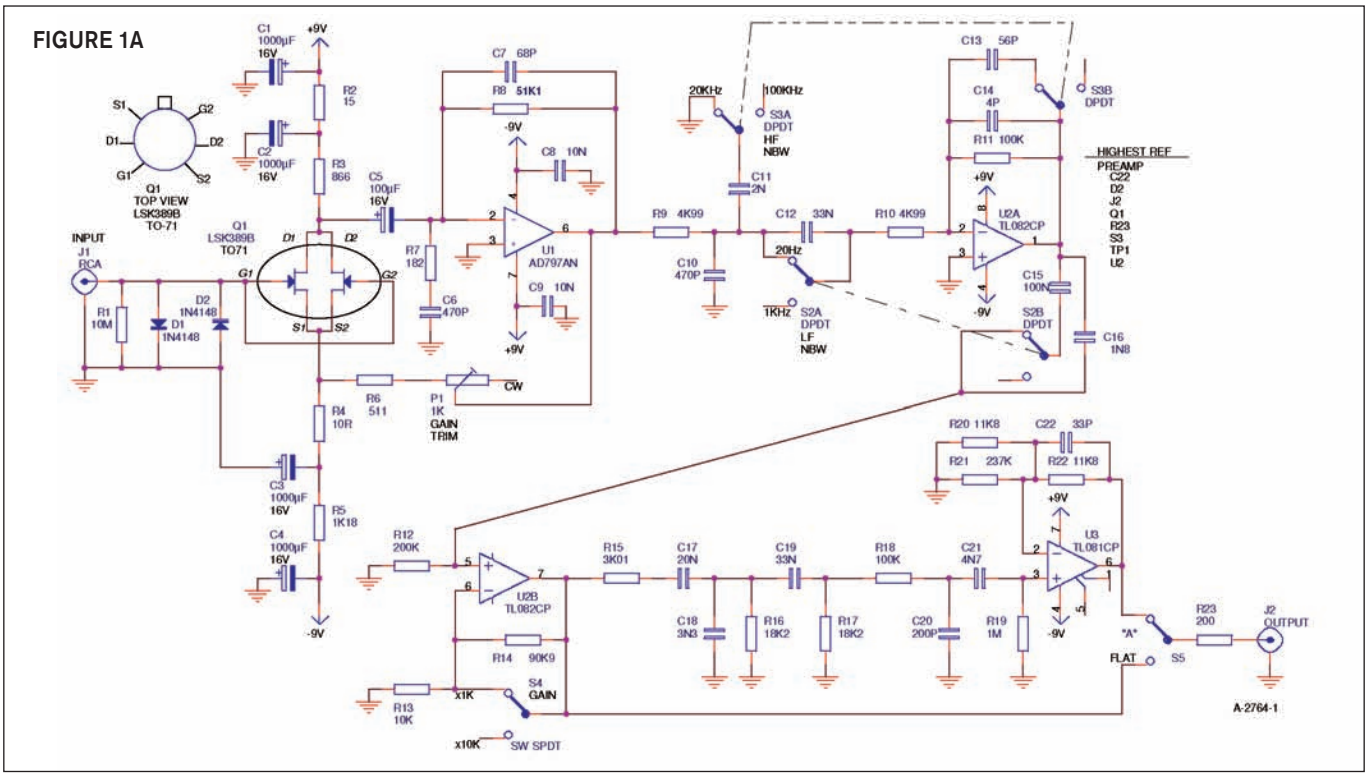

TABLE 1: Effect of RPK on gain and output impedance of the SRPP. The lower valve is always biased at -1.4V. Both valves are of the 6DJ8 type.

RPK	Gain, |Av|	$A_v/A_{v'ideal}$	Output impedance, Zo	$Z_o/Z_{o'ideal}$	IP
1.8kΩ	24.20	0.84	0.70kΩ	4.21	3.7mA
1.5kΩ	23.96	0.83	0.73kΩ	4.37	3.7mA
1.2kΩ	23.50	0.82	0.78kΩ	4.67	3.7mA
0.92kΩ	23.05	0.80	0.80kΩ	4.79	3.7mA
0.56kΩ	21.80	0.76	0.91kΩ	5.45	3.7mA
2.7 kΩ	23.60	0.82	0.97kΩ	5.8	2.7mA

CF with the same triode. However, the overall performance of the SRPP is not too bad because it can venture and occupy part of the MF territory in Figs. 2 and 3 of his article.

Table 1 shows some measurements based on the basic SRPP circuit, except that R_K is replaced with two signal diodes, such that the bias voltage for the bottom valve is kept at around 1.4V and the effects of R_K on gain and frequency response are both minimized. The results are compared with the *ideal* gain and output impedance of a CC and CF combo. The *ideal* gain and output impedance turn out to be 28.8 and 167Ω, respectively, when using a bias current of 3.7mA.

I can conclude that the SRPP with R_{PK} >1kΩ performs well for such a simple arrangement. The output impedance is high when compared with an *ideal* CF, but is still very reasonable for a valve circuit. Its performance will deteriorate with reducing R_{PK}. To extract the best from this topology you should maximize R_{PK}. However, R_{PK} affects the bias voltage of the top valve and so a proper combination R_{PK} and I_P must be selected.

The last row (of **Table 1**) shows the effect of increasing R_{PK} while reducing the bias current, which lowers μ and $1/r_P$. The SRPP is often designed with $R_{PK} = R_K$ (if it exists), presumably to keep both valves under the same bias condition. However, I do not think that this condition is important (when used as a voltage amplifier) and that the design can be flexible. Indeed the performance of the SRPP can be designed to approach the theoretical ideal values as discussed in an article I wrote[2].

REFERENCES

1. C. Paul, "The Cathode Follower and Its Weaker Siblings," Jan. '07 a*udioXpress*, p. 22.
2. C.C. Wong, "Design a High-Performance Valve-Based Line Amplifier," Oct. '05 *audioXpress*, p. 5.

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NOT EVERYBODY IS AN ENGINEER

I originally subscribed to *Speaker Builder* and have enjoyed the new format of *aX*, perhaps learning a little about electronics and certainly being exposed to great audio information. Sometimes, though, the articles do not seem to be directed

to a broad audience that I believe your magazine should attract.

For example, an article in October 2006, "Inside the ISO Max," caught my eye. My recently upgraded system has some hum. I read the article multiple times, trying to learn what this equipment would do to help with my problem. There was no information in the article about practical applications.

I find this to be a fairly common issue. The authors appear to be very knowledgeable; of course, I have no audio or electrical engineering knowledge and would not judge the articles on that basis. I do have practical application in the use of audio equipment and would have enjoyed reading about the use of the equipment. I found it kind of surprising that the Jensen website contained almost no consumer information.

The model articles are the speaker builder articles, measurements, parts list, construction suggestions, which are all very useful to the average reader. The magazine in the current format could be much more useful if a little more hands-on information were supplied to the reader.

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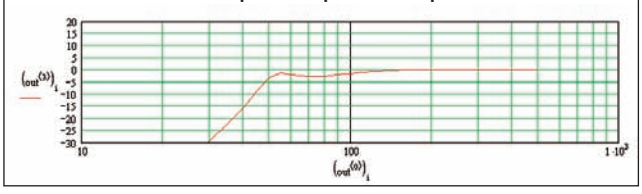
PORTED PERSPECTIVE

The speaker design presented in Bjorn Johannesen's article ("TABAQ: Tang Band Quarter Wave," March '07 *aX*, p. 38) was interesting because of its simplicity. The design looks remarkably like a ported speaker, and though I have no doubt of the validity of Bjorn's and Martin King's assertion that it isn't, I modeled a ported system using the same speaker, box volume, and tuning frequency, and picked a low box Q to account for the stuffing. The resulting response is almost identical to that of Bjorn's design. The output graph is shown in **Fig. 1**, formatted to resemble Bjorn's graphs.

FIGURE 1: Simulated ported speaker response.



The obvious question is how similar or not would Bjorn's mass-loaded quarter-wave speaker sound to a ported design? Does the quarter-wave design offer any advantages such as reduced distortion, and so on?

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ISOLATION TRANSFORMER

Regarding Dennis Colin's "An Audio Isolation Box," (*aX* 3/07, p. 30), I totally agree that a transformer provides excellent isolation. I routinely interface an audio recording truck to video. The audio truck's ground reference is the stage where we get power and splits from the microphones. Then the video equipment is always somewhere else in the building. Classic ground loop situation.

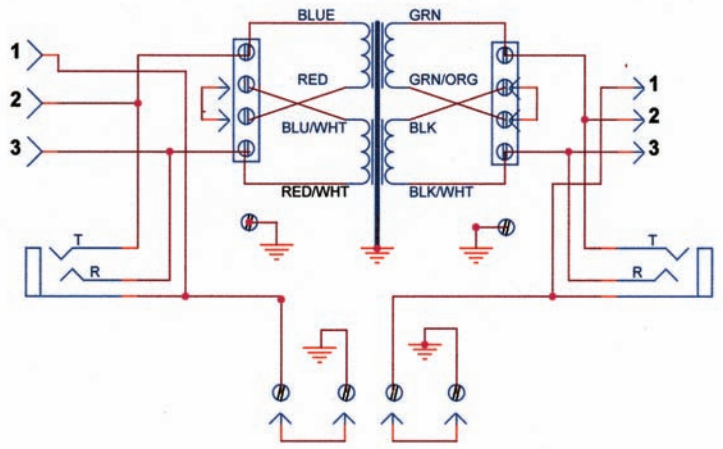
I provide what I call "The Mother Of All Isolation Transformers": four Western Electric 111C repeat coils mounted in a steel utility box. Only pins 2 and 3 of the "3 pin professional audio connectors" are wired to the primary and secondary of the 111C repeat coil. Pin 1 is not connected, and because I've found random and haphazard wiring of audio connectors used by the vidiots, the connectors themselves are insulated from each other and the steel box.

The WE 111C repeat coil is about the best audio 1:1 transformer ever made. No problems ever observed using these.

In addition, I have Jensen JT-11SSP-6M transformers in individual boxes for other isolation needs. They are wired exactly as Jensen designed in their application note AS009. You can get that at www.jensen-transformers.com/as/as009.pdf.

Finally, for system troubleshooting I built up more flexible isolation transformer assemblies using Triad A-67J transformers, which aren't as good as either the WE 111C or the Jensen JT-11SSP-6M, but I had them in my parts collection. They are wired so that all of the connections are available at terminal strips. I can wire the transformers for 1:1, 4:1, or 1:4, and I can isolate the ground on the

FIGURE 1: Isolation transformer. A-67J



input, output, or both. Once I've sorted out the most useful configuration, then a permanent solution can be fabricated.

A copy of that schematic is shown in **Fig. 1**.

Regarding Mr. Colin's article, the only comments I have are I would have used "3 pin professional audio connectors" for the output, wired transformer secondary to pins 2 and 3, leaving pin 1 not connected.

Partly because I have learned to wire things as "balanced" as possible with audio current running in pairs and not on a shield, and partially because I have a deep aversion to RCA connectors—no matter how fancy, expensive, and machined from solid unobtanium by virgins in the light of a new moon they may be.

I've used literally miles of Belden 8723, the equivalent of the Alpha wire he used. This is a handy configuration for running stereo balanced wiring, but so far I have not found an elegant and fast way to split out the two pairs to connect them to individual connectors. Generally if I want it to look good, I spend time using heat shrink to build a "Y" at the end. Another alternative to Belden 8723/Alpha 2466C is a wire configuration with two individually shielded and jacketed pairs that are joined together in a "zip cord" configuration. An example of this is Belden 1504A cables, which is common in the A/V world.

I keep scraps of plastic on hand instead of wood to make insulators.

Locally, "Tap Plastics" has a scrap bin, and I can purchase odd sizes of plastic scraps 1″ or 3⁄16″ thick for a few dollars.

Mr. Colin showed how a reactive load on a transformer can affect its performance, both in the amplitude and time domains. Generally a low impedance (i.e., 600Ω to 600Ω) transformer is best at the output of a device where there is a low impedance low reactance source, and a high impedance (i.e., 10kΩ to 10kΩ) transformer is best at the input of a device where there is a short low reactance connection to the device input. For absolute control over the time and amplitude response, you can fine-tune the system with RC networks as he outlined, but those parameters are situation dependent and not universal. Different lengths of cable and different types of cable (mostly changing the capacitance) will require adjustment of the RC network.

If you have a ground loop problem and aren't up to making your own isolation assembly, there are manufactured ones available. Radio Shack has the 270-054 Ground Loop Isolator, but at that price point ($16.99) you are definitely not getting a high-quality transformer. A far superior choice is the Iso-Max line from Jensen Transformers. They make both terminal strip versions for permanent installation and connectorized versions for other applications. In this case you are getting a high-quality transformer, but you will pay much more for the device. The information is available on their website.

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